

## CLAIMS:

1. An apparatus for applying electrical pulses to a patients body by at least two electrodes at respective locations on the patients body, the apparatus comprising a pulse generating unit connectable to the electrodes, the pulse generating unit being arranged to provide a series of electrical pulses, wherein said series of pulses comprises a plurality of first and second polarity impulses having a temporal spacing between the first and second impulses, wherein each impulse has a width of between 2 to 30 $\mu$ S.
2. An apparatus as claimed in claim 1, wherein the first polarity is positive and the second polarity is negative.
3. An apparatus as claimed in claim 1, wherein the first polarity is negative and the second polarity is positive.
4. An apparatus as claimed in claim 1, 2 or 3, wherein each impulse has a width of more than 10 $\mu$ S.
5. An apparatus as claimed in claim 4, wherein each impulse has width of 15 to 20 $\mu$ S.
6. An apparatus as claimed in any of claims 1 to 5, wherein said series of pulses has a spacing of at least 4 $\mu$ S between impulses.

7. An apparatus as claimed in any of claims 1 to 5,  
wherein said series of pulses has a spacing of at  
least 6 $\mu$ S between impulses.
- 5 8. An apparatus as claimed in any of claims 1 to 5,  
wherein said series of pulses has a spacing of at  
least 10 $\mu$ S between impulses.
- 10 9. An apparatus as claimed in any of claims 1 to 5,  
wherein said series of pulses has a spacing of at  
least 20 $\mu$ S between impulses.
10. An apparatus as claimed in any of claims 1 to 7,  
having a maximum spacing of 10 $\mu$ S between impulses.
- 15 11. An apparatus as claimed in any of claims 1 to 8 having  
a maximum spacing of 20 $\mu$ S between impulses.
- 20 12. An apparatus as claimed in any preceding claim,  
wherein a temporal space exists between a plurality of  
contiguous impulses.
- 25 13. An apparatus as claimed in any preceding claim,  
wherein a temporal space exists between a majority of  
impulses.
14. An apparatus as claimed in any preceding claim,  
wherein a temporal space exists between all impulses.
- 30 15. An apparatus as claimed in any preceding claim,  
wherein each impulse has an asymmetric shape.

16. An apparatus as claimed in claim 15, wherein the transition time from 0 Volts to a peak magnitude is less than or equal to 30% of the impulse width.
- 5 17. An apparatus as claimed in claim 16, wherein the transition time from 0 Volts to the peak magnitude is less than or equal to 10% of the impulse width.
- 10 18. An apparatus as claimed in claim 17, wherein the transition time from 0 to the peak magnitude is less than or equal to 5% of the impulse width.
- 15 19. An apparatus as claimed in claim 18, wherein the transition time from 0 to the peak magnitude is less than or equal to 1% of the impulse width.
- 20 20. An apparatus as claimed in any previous claim, wherein the transition time between the positive voltage peak and the negative voltage peak is at least 70% of the pulse period.
- 25 21. An apparatus as claimed in any preceding claim, wherein said impulses have a peak amplitude lying within the range 50 to 450 Volts, plus or minus respectively.
- 30 22. An apparatus as claimed in claim 21, wherein each impulse has an amplitude within the range 150 to 250 Volts, plus or minus respectively.
23. An apparatus as claimed in any preceding claim, wherein the magnitude of positive peak amplitude is

substantially equal to the magnitude of the negative peak amplitude.

24. An apparatus as claimed in any preceding claim,  
5 wherein during the spacing between impulses the output of the pulse generating unit remains at a level substantially equal to zero Volts.
25. An apparatus as claimed in any preceding claim,  
10 wherein the series of impulses are delivered at a predetermined frequency lying within the range 100Hz to 250kHz.
26. An apparatus as claimed in any preceding claim,  
15 wherein the series of impulses are delivered at a predetermined frequency lying within the range 1kHz to 250kHz.
27. An apparatus as claimed in claim 26, wherein the  
20 predetermined frequency lies within the range 1kHz to 5kHz.
28. An apparatus as claimed in claim 26 or claim 27 in  
25 which the predetermined frequency lies in the range 2kHz to 3kHz.
29. An apparatus as claimed in any preceding claim, in  
which said series of pulses comprise a third impulse spaced from the second impulse by a temporal spacing.
30. An apparatus as claimed in any of claims 1 to 24,  
wherein the series of impulses is an intermittent series of pulses.

31. An apparatus as claimed in claim 30, wherein, in said intermittent series of electrical impulses, the ratio of the time period for which no impulses are being provided to the time period for which impulses are being regularly provided is within the range 1:3 to 1:20.
32. An apparatus as claimed in claim 31, wherein said ratio is approximately 1:10.
33. An apparatus as claimed in any of claims 30 to 32, wherein at least one pause occurs in said intermittent series of impulses at least once every second
34. An apparatus as claimed in any of claims 30 to 33, wherein said pause is of duration of at least 0.5 millisecond.
35. An apparatus as claimed in any preceding claim, further comprising a battery for providing power to said generating unit for the generation of said pulses.
36. An apparatus as claimed in any preceding claim, further comprising at least two electrodes arranged for connection to said generating unit, for supplying electrical pulses to respective locations on the patients body.
37. An apparatus according to any preceding claim for providing therapy to a patient.

38. An apparatus as claimed in any preceding claim, wherein said apparatus is for supplying electrical pulses to two or more locations on the patients body overlying the central nervous system, such that the  
5 pulses induce analgesic effects in the central nervous system, whilst stimulating peripheral nerves that lie between the electrodes and the central nervous system to a lesser extent or not at all.
- 10 39. An apparatus as claimed in any preceding claim, wherein said apparatus is for providing iontophoresis to a patients body by at least two iontophoresis electrodes at respective locations on the patient's body, the apparatus comprising a pulse generating unit  
15 connectable to the electrodes, the pulse generating unit being arranged to provide a series of electrical pulses having a peak amplitude of at least 50 Volts.
- 20 40. An apparatus as claimed in claim 39, further comprising at least two iontophoresis electrodes arranged for connection to said generating unit, for supplying electrical pulses to respective locations on the patient's body, at least one of said electrodes incorporating a medication in ionic form for  
25 application to the patient's body.
41. An apparatus for applying an intermittent series of electrical pulses to the body of a patient substantially as described herein with reference to  
30 Figures 2 to 8.
42. A method for applying electrical pulses to a patients body by utilising at least two electrodes at

respective locations on the patients body, the method comprising applying an intermittent series of electrical pulses.

- 5 43. A method for providing iontophoresis to a patient by utilising at least two electrodes at respective locations on the patients body, at least one of the electrodes incorporating an ionic medication, the method comprising applying a series of pulses, each  
10 pulse having a peak amplitude of at least 50 Volts to the electrodes, such that the medication is passed into the body of the patient.
44. A method for applying an intermittent series of  
15 electrical pulses to the body of a patient substantially as described herein with reference to Figures 2 to 8